

the respective positions of the respective portions of the wall of the blood vessel that correspond to the first supersonic-wave elements and are calculated by the second wall-position calculating means." Claim 7 recites a similar feature.

The Office Action asserts that col. 4, lines 29-37 and col. 6, lines 16-26 of Bonnefous disclose the claimed blood-vessel-shape calculating means. However, such an assertion is incorrect for the reasons discussed below.

Bonnefous discloses moving a probe 2 extremely slowly such that the lines 11 and 12 coincide with the points P and Q of the traces 15 and 16. For this reason, the signal processing circuit 38, the display configuration memory 44 and the like merely examine whether or not the points P and Q of the traces 15 and 16 *are centered* on lines 11 and 12. Furthermore, as shown in Figs. 2-4 of Bonnefous, the sectional shape of the artery 6 is displayed essentially in *an ellipse shape*, and is not an orthogonal section. Thus, the signal processing circuit 38, the display configuration memory 44 and the like do not operate to obtain an accurate sectional shape or area of the traces 15 and 16, which appear as the ellipse shape. Therefore, Bonnefous at least does not teach or suggest a blood-vessel-shape calculating means for calculating a shape of the blood vessel on an orthogonal section thereof, as recited in claims 1 and 7.

Furthermore, the features of claim 1 allow for accurate examination of the inner skin function of the blood vessel based on variation rate within a few percent of the artery diameter. Such features can overcome the disadvantages in Bonnefous caused by the sectional ellipse shape of the artery displayed on the traces 15 and 16.

For at least these reasons, withdrawal of the rejection of claims 1 and 7, as well as claims 2 and 8 depending therefrom, is respectfully requested.

**B. Claims 5 and 11**

Claim 5 recites, in part, "a relative-angle calculating means for calculating an actual relative angle between the center axis of the blood vessel, calculated by the center axis calculating means, and the direction in which the Doppler supersonic-wave element emits the supersonic wave toward the blood vessel; and a blood-flow-velocity correcting means for correcting, based on the actual relative angle calculated by the relative-angle calculating means, the velocity of the blood flow calculated by the blood-flow-velocity calculating means." Claim 11 recites a similar feature.

The Office Action asserts that col. 4, lines 46-51 of Bonnefous disclose the claimed relative angle calculating means. However, such an assertion is incorrect for the reasons discussed below.

As discussed above, Bonnefous merely discloses centering points P and Q of traces 15 and 16 on lines 11 and 12. In contrast, when the claimed center axis calculating means calculates the center axis, the sectional blood vessel shape (for example, the depth of the blood vessel from the skin surface) is considered. Thus, the relative angle between the center axis of the blood vessel and the direction of the Doppler supersonic-wave is calculated in the sectional view (i.e. in the vertical direction) of the arm or the blood vessel.

In contrast, in Bonnefous, the relative angle is calculated in the plan view (i.e. the sectional view in the horizontal direction) of the arm or the blood vessel. Thus, Bonnefous does not teach or suggest the claimed relative-angle calculating means. Further, as Bonnefous does not teach the claimed relative-angle calculating means, it also cannot teach or suggest the claimed blood-flow-velocity correcting means for correcting the velocity of the blood flow based on the actual relative angle calculated by the relative-angle calculating means.

For at least these reasons, withdrawal of the rejection of claims 5 and 11 is respectfully requested.

## **II. Rejections Under 35 U.S.C. §103**

The Office Action rejects claim 3 and 9 under 35 U.S.C. §103(a) over Bonnefous. The Office Action also rejects claims 4, 6, 10 and 12 under 35 U.S.C. §103(a) over Bonnefous in view of Li (U.S. Patent Application Publication No. 2003/0114756). These rejections are respectfully traversed.

Claims 3, 4, 6, 9, 10 and 12 depend from allowable base claims as discussed above. Therefore, withdrawal of the rejection of claims 3, 4, 6, 9, 10 and 12 is respectfully requested for at least the reasons discussed with respect to claims 1, 5, 7 and 11.

Further, with respect to claim 6, the Office Action acknowledges that Bonnefous fails to teach the claimed orthogonal-section-area calculating means, and relies on Li to remedy this deficiency. However, Li also fails to teach the claimed orthogonal-section-area calculating means.

As shown in Fig. 1, the sample surface 14 is no more than an arbitrary surface crossing the blood vessel. No description explaining the orthogonal crossing of the sample surface 14 to the blood vessel is found. See paragraph [0007]. Furthermore, the section of the blood vessel to be used upon measurement of the blood flow amount (volume) is the 3-D flow image appearing on a spherical surface, not on a sectional surface orthogonal to the blood vessel. See paragraph [0008]. Thus, even if combined, Bonnefous and Li do not disclose the subject matter recited in claim 6.

Furthermore, one of ordinary skill in the art would not have had any reason to combine Bonnefous and Li. The Office Action asserts that one of ordinary skill in the art would be motivated to combine Bonnefous with Li "to be able to calculate parameters important for examining the condition of the heart, such as the volume flow rate of blood (i.e. blood flow amount). However, to accurately calculate the blood flow amount, both the blood flow speed and the sectional area of the blood vessel need to be accurately calculated. Even if

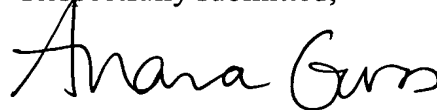
Li could calculate the cross sectional area, Bonnefous hardly calculates accurate blood flow velocity. Therefore, the Office Action's motivation to combine Bonnefous and Li is without merit.

For at least these reasons, withdrawal of the rejection of claims 3, 4, 6, 9, 10 and 12 is respectfully requested.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachment:  
Petition For Extension of Time

Date: December 10, 2007

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